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fresh developer for each plate. In the case of the first slide stained in alumcarmine and Bleu de Lyon as in the Set A, the normal exposure for the 10 micromillimeter section was twice that for the 5 one, and the normal exposure for the 20 micromillimeter section was four times that of the 5 one. In the case of the Set B all slides required the same exposure.

In analyzing the results thus obtained we come to the conclusion that the thickness of the section, within the limits given, has no influence whatsoever on the length of exposure; but that the latter stands in a direct ratio to the amount of stain absorbed by the tissue.

For practical purposes, especially for those who are using my table of R-P factors, the results of this investigation may be interpreted as follows: disregard the thickness of the sections and the appearance of the stain under microscope and pay attention only to the intensity as it appears to the naked eye. The table refers to normally well stained sections of medium thickness. Double the exposure for darker appearing and reduce the exposure by half for lighter appearing sections.

It will be observed that in the experiments elements 2 and 3 remained of constant value for the simple reason that the tissue used was not only the same in kind, but actually from the same piece of organ and was stained in the same stain in each set of slides. A comparison of the length of normal exposure in the case of sections stained in alumcarmine and Bleu de Lyon with those stained in hæmatoxylin and tetrabromfluorescic acid serves to confirm my statement at the beginning of this article, that the relative luminosity of different stains may be entirely disregarded in the matter of exposure.

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SEX RATIOS IN PLATYGASTER

IN the *Journal of Heredity* for last year (Vol. X, p. 344) I published data on sex ratios in three species of polyembryonic Hymenoptera. One of these is *Platygaster felti*, which parasitizes the eggs of two species of the Cecidomyiidæ, *Walshomyia taxana* and *Rhopalomyia sabinæ*. These flies make their galls on the mountain cedar, *Sabina sabinodes*.

Since the above data were published I have had an opportunity to breed out in the laboratory a total of 200 broods of

Platygaster; 73 from the carcasses of *Rhopalomyia* and 128 from those of *Walshomyia.* The remarkable character of the sex ratios, as revealed in the published data, is emphasized by the additional facts secured from the more recent rearings. It therefore seems worth while to publish the full data, which is given in condensed form in the following table. In the first column the total number of individuals in each brood is given; in the second, the number of females; and in the third, the number of males. In the fourth column are listed the number of broods showing the combination of females and males in the corresponding horizontal line.

The total number of individuals in the 200 broods is 2,722, of which 2,346 are females and 376 males. The average per brood is 13.61. The size of the brood reared from *Walshomyia* is very much smaller than those from *Rhopalomyia.* There are 1,417 individuals in the 128 broods from *Walshomyia,* or an average of 11.07 per brood. The broods from *Rhopalomyia* have 1,305 individuals, or an average of 18.12 per brood. This represents an average increase of 63.6 per cent. The rate of increase in the number of males per brood from *Walshomyia* to *Rhopalomyia* is almost the same as this. The average number of males in broods from *Walshomyia* is 1.55, and in those from *Rhopalomyia* is 2.45. This represents an increase of 58 per cent.

The difference in the size of broods is, in all probability, due to the difference in the size of the two host larvæ. The larva of *Rhopalomyia* is almost twice as large as that of *Walshomyia,* and hence must furnish a more abundant food supply for the multiplication of embryos at the time of their formation in the polygerm.

One of the most striking facts in the data is the preponderances of females. Approximately 86 per cent. of the individuals are females. No male brood has been found, and in not a single instance does the number of males exceed or even equal the number of females in a brood. There are, however, nine pure female broods. Of the 191 mixed broods 113, or 59.61 per cent., have a single male present in each brood. The other 78 broods show the following numbers of males: Thirty with two males each; twenty-four with three each; ten with four each; four with five each; four with six each; three with seven each; two with eight each; and one with ten.

Another interesting fact is the frequent occurrence of broods with a single male. Almost sixty per cent. of the mixed broods

TABLE I

BROODS OF PLATYGASTER FELTI

No. of Individuals	Females	Males	No. of Broods
5	3	2	1
5	4	1	1
6	5	1	4
7	5	2	1
7	6	1	14
8	6	2	2
8	7	1	9
9	7	2	2
9	8	1	13
9	9	0	3
10	7	3	1
10	8	2	1
10	9	1	31
10	10	0	1
11	8	3	2
11	9	2	4
11	10	1	15
12	10	2	2
12	11	1	3
13	9	4	1
13	10	3	3
13	11	2	3
13	12	1	5
13	13	0	1
14	10	4	1
14	11	3	2
14	12	2	2
14	14	0	1
15	12	3	1
15	13	2	6
15	14	1	7
15	15	0	1
16	13	3	2
16	14	2	2
16	15	1	3
16	16	0	1
17	13	4	1
17	14	3	2
17	15	2	2
17	16	1	2
18	14	4	1
18	15	3	2
18	17	1	4
19	15	4	1
19	16	3	3
19	17	2	1
19	19	0	1
20	16	4	1
20	17	3	1
21	17	4	1
21	18	3	1
22	17	5	2
22	20	2	1
22	21	1	2
23	19	4	1
23	20	3	2
24	20	4	1
25	17	8	1

TABLE I (*Continued*)

BROODS OF PLATYGASTER FELTI

No. of Individuals	Females	Males	No. of Broods
26	20	6	1
26	21	5	1
26	22	4	1
26	23	3	1
27	21	6	1
28	25	3	1
29	24	5	1
31	24	7	2
34	26	8	1
34	27	7	1
36	26	10	1
36	30	6	1
37	31	6	1

are of this character. Certain combinations, such as nine females and one male, occur with very great frequency, suggesting that a single male is produced at some definite point in development. Statistical treatment of the data supports this suggestion. My colleague, Dr. Muller, has kindly calculated the standard error and standard deviation of the numbers of males per brood, and finds that they are 1.17 and .64 respectively. These results show that the number of males produced per brood does not vary as much as it would if males were formed at random. If males were produced at random, the amount of variation in the number of males would be expressed by a standard deviation of 1.17. This means that there is a tendency to have the production of males confined to particular cells in the embryonic mass, so that only one or two males are usually formed in a brood.

The fact that the parasite deposits one egg at each oviposition makes it practically certain that the mixed brood of *Platygaster* is the product of a single fertilized egg. The important question is how the single male originates during the course of development. I have elsewhere discussed this question, and have suggested that the appearance of one or more males in a brood may be due to an abnormal behavior of the sex chromosomes. An abnormal division causing the loss of an x-chromosome from one of the early blastomeres would explain the appearance of a mixed brood, for such a cell could become the progenitor of one or more males.

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